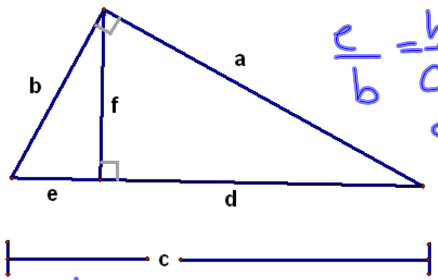


$\frac{e}{b} = \frac{b}{c}$ $b^2 = ec$

$\frac{d}{a} = \frac{a}{c}$

$a^2 = dc$

$dc + ec = a^2 + b^2$

$c(d+e)$

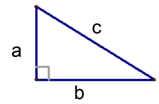
$c \cdot c = a^2 + b^2$

c^2

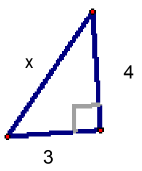
7.2 The Pythagorean Theorem

Thm 7.4--The Pythagorean Theorem--In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the legs

$$c^2 = a^2 + b^2$$



President Garfield

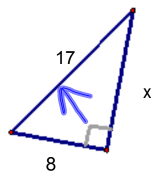


$c^2 = a^2 + b^2$

$x^2 = 4^2 + 3^2$

$x^2 = 16 + 9 = 25$

$x = 5$



$17^2 = x^2 + 8^2$

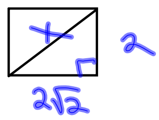
$289 = x^2 + 64$

$225 = x^2$

$15 = x$

Find the diagonal of the rectangle with width of 2 and a length of $2\sqrt{2}$

$2\sqrt{2} \cdot 2\sqrt{2}$



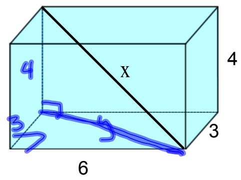
$x^2 = 2^2 + (2\sqrt{2})^2$

$4 \cdot 2$

$4 + 8$

$\sqrt{x^2} = \sqrt{12}$

$x = 2\sqrt{3}$



$y^2 = 3^2 + 6^2$

$9 + 36$

$y^2 = 45$

$y = 3\sqrt{5}$

$x^2 = 4^2 + (3\sqrt{5})^2$

$16 + 45$

$x = \sqrt{61}$

Pythagorean Triples

3 4 5   5 12 13   8 15 17   7 24 25

6 8 10

9 12 15

Theorem 7-5 The Converse of the Pythagorean Theorem--If the square of one side of a triangle is equal to the sum of the squares of the other two sides, then the triangle is a right triangle.

If $c^2 = a^2 + b^2$, then Δ is Right

c is the largest number.

If $c^2 > a^2 + b^2$, then Δ is Obtuse

If $c^2 < a^2 + b^2$, then Δ is Acute

Examples

3, 7, 8

$8^2 \; (?) \; 3^2+7^2$

$64 > 9+49$

Obtuse

8, 16, 17

$17^2 \; \bigcirc \; 8^2+16^2$

$289 < 64+256$

Acute

$\sqrt{5}$ $\sqrt{20}$ 6

$6^2 \; \bigcirc \; \sqrt{5}^2+\sqrt{20}^2$

$36 > 5+20$

Obtuse

What type of triangle is ΔABC? Right

A(-9, -3)
B(1, -1)
C(-3, -7)

$AB = \sqrt{(-3+1)^2 + (-9-1)^2}$ (4, 100)

$AB = \sqrt{104}$

$BC = \sqrt{(1 - -3)^2 + (-1 - -7)^2} = \sqrt{52}$ (16, 36)

$AC = \sqrt{(-9 - -3)^2 + (-3 - -7)^2} = \sqrt{52}$ (36, 16)

$\sqrt{104}^2 \; (=) \; \sqrt{52}^2 + \sqrt{52}^2$

HW
p354
12-16, 19,22-24, 27 (Is it right, obtuse, or acute?)